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Biological Products in Veterinary Medicine.

Dr. J. STANLEY WHITE'S ADDRESS TO THE CENTRAL V.S.

Dr. J. STANLEY WHITE, of the scientific staff of Messrs. Parke, Davis & Co., addressed the members of the Central Veterinary Society, at 10 Red Lion Square, W.C., on March 2nd, on the subject of "Biological Products in Veterinary Medicine," the lecture being illustrated by a large number of lantern slides. Dr. White first referred to sera and gave some idea of how they were manufactured on a big scale. In order to simplify the demonstration of the practical manufacture of serum, he discussed particularly antidiphtheritic serum, although antitetanic serum, he pointed out, was manufactured in precisely the same way. First of all it was necessary to have large quantities of media at hand and then prepare a pure culture of the particular organism and next to prepare the toxin. One slide showed a mixed growth of 18 hours culture, from which the colonies were separated out and a typical diphtheritic colony selected, confirmed by microscopical examination. He exhibited a slide showing the bacilli known as K.L.B., which, he pointed out, had characteristic staining properties, the ends of the organism demonstrating what was known as bi-polar staining, which was one method of identifying the organism. The next thing was to inoculate the media which had been prepared, and he showed a slide illustrating flasks inoculated with pure cultures. Each of the flasks contained nutrient boullion inoculated with the pure culture of diphtheritic bacilli or whatever serum was being made. Those flasks were put into an incubator for anything from ten days to a fortnight, during which the organisms multiplied and, in the case of the tetanic and diphtheritic bacilli, elaborated exotoxin. The flasks became highly charged with toxins and were actually spoken of in the laboratory as flasks of toxins; they contained large quantities of debris as well as the toxin. It was necessary to filter the toxin and that was done by passing it through a porcelain or Berkefeldt filter under pressure. It then differed from the original toxin by being very much clearer. No chemical method was known by which the flask of toxin could be standardised; in fact nothing was known about the chemistry of toxins, and perhaps the greatest problem which awaited the bio-chemist was an analysis of such complex proteins. The idea was to determine the minimum amount of toxin which would kill a guinea-pig in four days, and in that way it was possible to compare it with a standard anti-toxin and say how much toxin was in the flask and what it was capable of doing. Usually six guinea-pigs were used for testing each flask of toxin. A slide was shown of a farm where particular sera and biological products were made, the farm extending to about 700 acres and having anything from 500 to 600 horses, which were used entirely in the preparation of sera. In that laboratory from 15,000 to 16,000 guinea-pigs were kept and nothing was thought of testing 300 cases of toxin a day, and as each flask required at least six guinea-pigs, one could see the enormous numbers that were necessary. The stables had concrete flooring; the horses were not kept in stalls, but divided and allowed plenty of room. The whole of the place was kept in as aseptic condition as possible, and there were most ingenious arrangements for turning the animals out in case of necessity. The animals lived under ideal conditions. In pre-war days the animals cost about £20 to £30 each. They had to be free from disease, even a cracked hoof being enough to condemn an animal for the manufacture of biological products. The animals were always tested with mallein and given a dose of antitetanic serum and usually tested with tuberculin, but it was comparatively rare to find a horse suffering from tuberculosis. The horse was given a bath, scrubbed with creosol and soft soap, and then, about 0·1 c.c. of standardised virulent toxin was injected hypodermically. The animal showed by a rise in temperature and general symptoms of malaise that it was responding to this small dose of toxin. A day or two later a second injection was made and injections went on from about three to six months, sometimes nine months. As the end of that time the blood was usually highly charged with anti-toxic elements, the precise nature of which was not known. Then the horse was bled by making an incision into the external jugular vein, and as a rule about a gallon and a half of blood was withdrawn at one time. All horses were not capable of producing an appreciable quantity of anti-toxin. It was said that fair horses and dark horses appeared to differ and that had been noticed also in the human subject. The animal was bled until the anti-toxin units in the blood serum were not sufficient to warrant further bleeding for commercial purposes and the process of re-immunising the animal with doses of toxin was continued. Some of the animals became very valuable because they were known to be high anti-toxin producers. The blood was allowed to clot, clear serum rose to the

surface and was decanted, care being taken that there should be no contamination. It was filtered again and then put into cold storage for some months. All kinds of stray organisms seemed to get into the tubes, particularly the hay bacillus, which was always floating about and could be held behind in the Berkefeldt filter. The anti-toxin then had to be standardised and examined in many ways, first by a bacteriological test, and then by a physiological test. The serum was also introduced into a guinea-pig to see if any disease could be induced which might be missed by the bacteriologist. Then it was necessary to examine the serum in order to find the amount of anti-toxin units present. The test was the reverse of that used in standardising the toxin, the object this time being to determine the minimum amount of anti-toxin which would protect the guinea-pig against a standard dose of toxin. A table was shown, illustrating the series of doses which might be given in order to arrive at what was known as the immunity unit. The standard dose was one which for all intents and purposes represented, in the case of anti-diphtheritic serum, that amount which would protect 100 guinea pigs each from the minimum fatal dose of toxin. In the case of anti-diphtheritic serum and anti-tetanic it was very often necessary to give a maximum amount of anti-toxin units, but in a much smaller bulk, particularly so if it were given intravenously. Considerable success had followed intravenous use of anti-tetanic serum in veterinary practice in America. Too much protein should be avoided. It was an interesting fact that the anti-toxin elements seemed to be associated with the globulin fraction of the serum and that globulin could be separated out by a process of precipitation.

The manufacture of anti-tetanic serum was precisely the same as the manufacture of anti-diphtheritic serum, except that it was necessary to start with a smaller dose. It was an interesting organism which differed from the diphtheritic bacillus in that it tended to produce spores. In the earlier culture it was simply a rod, but at a later stage the spore formation was found and later on no rod and no bacillus, but only spores. It was the spore which was so notoriously difficult to kill. The great majority of pathogenic organisms did not produce any appreciable quantity of exotoxins, but the toxin remained within the organism and constituted endotoxin. This was a most important point, because it practically meant that anti-toxins were limited to anti-diphtheritic serum and anti-tetanic serum, and that was one of the reasons why serum therapy to a great extent was so limited. The exotoxin which was excreted by the tetanus bacillus was probably the most potent poison known to science to-day. A slide was exhibited, showing horses in the tetanus ward and Dr. White explained that during the time they were undergoing the process they were very carefully looked after, the temperature, pulse, etc., being taken every day.

In order to make anti-streptococcus serum it was necessary to start with killed cultures of *streptococci* and complete the immunisation of the horse with live cultures. As there were so many varieties the serum was always polyvalent. The serum had been used with considerable success in the treatment of pyæmic arthritis or joint-ill. The results had certainly warranted its use, both from a prophylactic as well as a curative point of view, but possibly from the prophylactic view it was better administered in conjunction with vaccines. Anti-streptococcus serum was not an anti-toxin; strictly speaking it was an anti-microbial serum, seeing that in its manufacture, the animals are not immunised with toxin.

With regard to anthrax, it was difficult to say when seen in a localised form in a human being whether the patient was suffering from smallpox or anthrax. As the toxin could not be obtained in quantity, it was necessary to use the killed cultures in order to produce an anti-anthrax serum. A preventive product was also prepared in the form of a vaccine, but not a vaccine in the strict sense of the term as regarded in this country, where vaccines were considered as consisting of killed organisms in normal saline solution. In America they spoke of that form of vaccine as bacterin, and the word vaccine was only used for such things as anthraxoids and blacklegoids, which were really attenuated organisms. Anthraxoids consisted of an attenuated form of anthrax spores which were used to produce immunity. But should the animal have anthrax it was no good relying on a vaccine, even in an attenuated form. The vaccine would stimulate the patients to produce antibodies, in other words to produce an active immunity. In order to produce a therapeutic effect and produce a result quickly, therefore, antibodies had to be given, whereas for prophylaxis reliance was mostly placed on a vaccine which would bring about an active immunity.

The anthrax spores were amongst the most difficult of any to kill. It had been recorded that the spores could remain in a dried, dormant condition for as long as twenty years and yet be quite active.

Dr. White exhibited a chart which referred to human as well as veterinary products, and said it was still a disputed point as to whether many of the sera were really of very much value.

With regard to tuberculosis, he exhibited slides showing the culture of the tubercle bacilli, which was a difficult organism to grow. Several weeks elapsed before any appreciable growth could be observed, and he considered glycerin and potato to be a very favourable medium. Bacteriologists were generally agreed that the majority of micro-organisms definitely came within the vegetable kingdom, but the line of demarcation was by no means sharp. The tubercle bacillus seemed to be somewhere in the intermediate stage. The organism was difficult to grow and stain, but once it had been stained it retained the colour, even though treated with 25 per cent. hydrochloric or nitric acid, and hence it was spoken of as an acid fast bacillus. The tubercle bacillus was also interesting because it produced both a soluble and an insoluble toxin. It was the soluble toxin which constituted the old tuberculin of Koch, which was used for diag-

nosis. If the tubercle bacillus was grown and filtered through a porcelain or Berkefeldt filter and concentrated to about one-tenth of volume or rather less, it could be used for veterinary purposes; it was usually preserved with glycerin and constituted the standard tuberculin for diagnosis. As a matter of fact 4 c.c. of veterinary tuberculin was usually equivalent to 0·5 gramme of old tuberculin of Koch's formula. In treatment various forms of tuberculin were used, but there was still need for something which could be regarded as a specific.

The orgarism responsible for farcy or glanders, the bacillus mallei, was grown for the production of mallein. Mallein could be used by simply relying on temperature and malaise which was set up as the result of the injection of a standard dose. During the war the intra-dermal palpebral test was used with much success. A small dose of about 2 mm. was injected into the lower eyelid, preferably into the dermis only, although no ill results happened when it went into the subcutaneous tissues. There was another method—the use of mallein opthalmic discs, which could be dropped into the eye and which produced a certain amount of lachrymation, and if the horse was positive there was usually some pus formation. It was, perhaps, the most convenient way of carrying out the mallein reaction.

A photograph was also shown of the bacillus responsible for blackleg or blackquarter; it was used for preparing anti-blackleg serum. The serum was indicated in the early stages of blackleg. The effect of a dose of anti-blackleg serum reached its maximum in about 9 to 10 hours and the dose could be repeated in 12 hours if necessary. For prophylaxis an attentuated vaccine in the form of pellets was mostly relied upon; it was prepared from the infiltrated tissues of animals which had died from blackleg. These pellets, or blacklegoids as they were called, were injected under the skin, usually in two separate doses, although it was an advantage should the animal be suspected of having come in contact with any animals suffering from the disease to give a dose of serum as well. Unfortunately it did not produce any degree of immunity until after 10 or 14 days. In the case of young animals it was of advantage to repeat the dose at intervals; for instance, in calves three months old the dose should be repeated in three months, and animals of six months should have the dose repeated in six months, and if a year old the dose should be repeated in another year. Provided the animals were over two or three years of age they seemed to be practically immune. The blacklegloids would keep well for two years, but once the phials had been opened they should be used within twenty-four hours.

A very interesting photograph was shown of the *bacillus bronchisepticus* which was first isolated by Dr. Ferry in America in 1908. About the same time it was isolated independently by other workers. In the early stage of the disease it was possible to get the organism in practically pure culture, but a little later on there were secondary invaders. The disease was very similar to influenza in the human being, although in that condition he thought it was doubtful if the primary etiological factor had been discovered. Canine distemper vaccine was sent out combined with *staphylococci* and *streptococci* of canine origin, and it was found that a better immunity resulted in that way rather than relying on the particular organism alone. There were cases where, perhaps, a dog had come into contact with distemper where something more than prophylactic measures were required, and the animal had to be given an opportunity of producing its own antibodies. In the early stages of distemper it was very much better to administer anti-distemper serum than anti-distemper vaccine.

The *bacillus coli communis*, an inhabitant of the small intestine in human beings as well as in animals, was interesting because it was probably the cause of so-called white scour in calves, and a serum known as anti-white scour serum was used with very much success by the late Mr. Wallis Hoare and other veterinarians. It was prepared from polyvalent cultures of the *bacillus coli*. White scour was an acute condition which produced diarrhœa and was rapidly fatal, and a serum was required rather than a vaccine in order to give antibodies immediately.

With regard to pneumonia, it was not possible to get at the toxin, and it was doubtful whether anti-pneumococcus serum was of any great value; there was no serum available for the acute condition and a vaccine took some days to work. Dr. White referred to pneumonia phylacogen in this connection and showed its advantages over both vaccine and serum. Several slides were shown illustrating the preparation of vaccine, which the lecturer described as being really a suspension of pathogenic organisms in normal saline solution, standardised and sterilised. There were many ways of counting the organisms, but Wright's original method was to compare it with the red blood cells, which in the average healthy adult male was approximately 5,000,000 red blood cells per cubic millimetre.

He should like to say a word about hormone products, because he thought they should be included under the broad heading of biological products. There were not many ductless gland products used in veterinary medicine, but there were two important ones, adrenalin and pituitrin. He showed a diagram of a kidney with the suprarenal gland. The latter consisted of two parts, the outer and inner, and pointed out that it was the medullary portion which contained adrenalin, present in such small quantities that the glands of 20,000 oxen were necessary to produce one pound of adrenalin. It was perhaps the only definite hormone which had been isolated and whose chemical formula was known. It was first isolated in 1901 by a Japanese named Takamine. It contained a benzene nucleus and a nitrogen group, so that it was probably alkaloidal in nature. Synthetic adrenalin was optically inactive, but natural adrenalin would rotate a ray of polarised light to the right, and was therefore dextro-rotatory. The

synthetic product was at least one-tenth less active. A remarkable fact was that adrenalin could be combined with cocaine and thus localise its distribution. It constricted the blood vessels and by its use the surgeon was able to work in a comparatively bloodless field, while at the same time the cocaine was localised to that particular area and bigger doses could be given. Although the chemistry of adrenalin was known, it could not be standardised by chemical means and physiological methods had to be adopted, and these the lecturer briefly described.

The pituitary body consisted of two parts, an anterior and a posterior lobe, the former being quite distinct from the latter, one being crystalloid and the other colloid. An animal could get on quite well without the posterior lobe. The anterior lobe was concerned with sex development, bone formation and so on, while the posterior lobe appeared to be concerned with carbohydrate metabolism. The posterior lobe was used in making pituitrin, which had a very striking effect on non-striated muscle. He thought the veterinary profession was indebted to Mr. Livesey for the first work done with pituitrin in veterinary practice, at any rate in this country. Its value in uterine inertia, the fact that it contracted the uterus was used as a method of standardising the product—the animal used being the guinea-pig. The uterus was a very delicate affair in a guinea-pig. This was dissected out and suspended in normal saline solution and the whole enclosed in a water bath. During the test, the uterus was kept alive by allowing oxygen to bubble through the saline, introducing minute quantities of the pituitrin under examination,and,comparing the effect with a standard, it was possible to see to what extent it would contract the uterus, the contractions being measured by an instrument known as a kymograph. Pituitary extract probably contained at least three, if not four active principles, one of which appeared to be concerned in contracting the uterus and the others in raising the blood pressure. Photographs were exhibited, showing the effect of feeding chickens with pineal extract. The pineal gland was situated in the centre of the skull and was a remnant of what was once, millions of years ago, the parietal eye, situated in the centre of the forehead. It had no ocular function to-day, but in some way appeared to be concerned with growth. Certain individuals who had enlarged pineal glands had been noticed to be particularly precocious.

Dr. White concluded his remarks with a reference to vitamines, which, he said, appeared to be in some way connected with hormones. Several foods were deficient in vitamines, one being polished rice. Charts and sections were shown illustrating vitamines and the effect of feeding with foods not containing vitamines. When the vitamines were absent there was no growth and the condition was poor. Even the lowest forms of life required vitamines. Cod liver oil was one of the most important foods containing fat soluble A. vitamine. By the use of fat soluble A., an extraordinary change could be brought about in human beings and in animals. In a dog, for instance, the animals went on growing and the condition of the coat and everything else very much improved. Some people had doubted the existence of vitamines, but they were a very important part of dietetics. Fat soluble A. played an important part in rickets. Some years ago, the authorities at the Zoological Gardens were quite unable to rear some bear cubs, and Sir John Bland-Sutton suggested they should feed the animals on bone marrow and cod liver oil; that was done and no further difficulty experienced. It was now realised that by giving cod liver oil they were giving fat soluble A. Several interesting slides were shown to illustrate the value of vitamines, and reference was also made to the water soluble B. and the water soluble C. types.

Discussion.

Colonel Williams thanked the lecturer for his most interesting lantern slides, and for the lucid manner in which the various points had been explained.

The dealing with disease prophylactically or curatively by means of sera, vaccines, and antitoxins, had reached a stage which was proving of great value to the veterinary profession.

He first used a vaccine for the treatment of equine catarrh at the Veterinary School, Poona, when there were very severe cases among valuable blood horses brought out to India.

Bacteriological examination showed a staphylococcic and streptococcic infection, and the vaccine used was streptococcus and staphylococcus (combined) veterinary tablets containing 100,000,000 killed bacteria.

The initial dose was 200,000,000 killed bacteria, it only took a few minutes to prepare and give; mild cases cleared up in about five days, and the cost was only about 5d. per dose, compared with the lengthy treatment and cost when using inhalations and electuaries, which only ameliorated the symptoms, recovery being dependent upon the formation of anti-toxins.

In severe cases the injection had to be repeated, a second dose being given about the fourth day, and such cases usually cleared up in about ten days.

As a result of this trial the same vaccine was used at a Remount Training Depot, Bangalore, Southern India, to deal with a big outbreak of equine catarrh at a time when it was most important that the issue of horses for overseas should not be held up.

The climate there was very good, dry, with a temperature of about 90 in the shade during the summer months, and the animals were put into a paddock and given an injection of the vaccine.

It was found that an initial dose of 400,000,000 killed bacteria gave better results than two doses of 200,000,000 at about four days interval.

When the discharge ceased they were moved to another paddock, and after further observation for a week they were discharged and got ready for shipment.

With regard to vitamines, he exhibited two photographs of a case of sclerostomiasis. The animal,

a five year old thoroughbred, arrived at Camberley, from Ireland, in an extremely debilitated condition; the owner had tried everything in the way of feeding with no result.

Intestinal parasites were suspected and oil of chenopodium was tried. The animal was starved for twenty-four hours, 6 drachms of oil of chenopodium, given in 4 ounces of linseed oil, followed three hours later by 1 pint of linseed oil and 1 ounce of turpentine. A large number of sclerostoma were passed, but the animal did not improve in condition afterwards and it was sent to the Royal Army Veterinary School, Aldershot, on 9th November, 1921, as a case for research; the weight then was 896lbs.

No more parasites were detected, and feeding experiments were carried out as it was thought that defective nutrition might be an important factor in this case. Foods said to contain the largest amount of vitamines were given (roots, etc.), with the result that the animal gained on an average 90lb. body weight per month, and on the 21st February, 1922, weighed 1,204 pounds.

Major HOBDAY said the lecture was one of the most interesting the Society had had; in fact if there could be a post-graduate course of lectures of the kind he was sure they could guarantee the essayist very appreciative and large audiences every time. Dr. White had put the subject so lucidly and so clearly as to interest everyone. As an older member of the profession he was not ashamed to admit that one could not know everything about every branch of the veterinary profession or a thousandth part of it. He was sure everyone would go away with renewed enthusiasm in their work and with a much clearer idea of how vaccines and sera were being prepared and used, and would appreciate much more than they had done the great work which was being carried out by researchers in biological products.

Professor WOOLDRIDGE, after thanking Dr. White for his interesting address, said he was not quite sure that in veterinary circles the acceptation of the word vaccine as used by Dr. White was the one ordinarily adopted. In veterinary circles the term vaccine was mainly used at the present time for those attenuated organisms which were used for the production of active immunity rather than the dead organisms, which were used to produce that kind of immunity which seemed to be between an active and passive immunity. There was a tendency perhaps, to accept, with regard to the dead organisms, the term which had been applied by the American workers—bacterins—in order to distinguish them from the true vaccines. Dr. White had projected a slide on the screen showing a list of sera in three columns. The sera in column i. were stated as proved to be definitely efficacious; those in column ii. probably efficacious; and those in column iii. appeared to be at the present time of little value, if any. He (the speaker) noticed that in the second list was included anti-anthrax serum. He should like to know whether it was a recent list, because he was under the impression that anti-anthrax serum was of decided value as a preventative of anthrax and probably of greater value still in those cases where anthrax was found in the very early and local stages, and it was used as a curative measure. With regard to the anti-venom serum, placed in the column iii., he should like to know if that had been proved to be practically useless, because he was under the impression that previous work in connection with it showed that it was efficacious, provided it was used sufficiently early. The important thing with regard to sera was that they should be used early, before the body had been overcome by the bacteria or their toxins. With regard to blackleg immunisation, several methods had been mentioned and passing reference had been made to the use of filtered cultures. He gathered from the author's remarks that he had at present some considerable reservations in his mind as to whether they were of any value or not. He (Professor Wooldridge) was under the impression that the work which had been done by Nitta and others showed that such materials were very decidedly effective in the vast majority of cases and that the filtered product could be used for immunising against blackleg without any danger of producing the disease. Sometimes, when attenuated vaccines were used, the animal might be in a particularly hypersensitive condition and the disease might be set up. In other cases the vaccine was not sufficiently attenuated, or, on the other hand, might be over attenuated and therefore inert. With reference to animals in the incubative stage not being expected to benefit, some practitioners had been called to task about that. They had inoculated calves with blackleg vaccine and the calves had ultimately died of blackleg, and the clients naturally assumed that the vaccination had been responsible for it. It was much more likely to be the case that they were already infected and that the vaccine was therefore unable to immunise them. There could be no question of causing the disease by the use of filtered toxins. With reference to distemper, he understood the author accepted the theory that the *bacillus bronchisepticus* was the etiological factor and had pointed out that there might be secondary organisms, for example *staphylococci* and *streptococci*. He might have gone a little further and accepted the fact that even the *bacillus bronchisepticus* was a secondary invader. It was a normal inhabitant of the upper respiratory tracts of most dogs in towns, and did not become pathogenic unless the ordinary resistance was reduced. It might, therefore, be responsible for lesions which followed the primary condition and those lesions might ultimately be the cause of death. Vaccination with that organism was likely to lead to disappointment and a false sense of security, and he knew of numerous instances where distemper had followed its use. On the other hand, he did not regard it as valueless, because if increased resistance could be produced against the secondary invaders the complications could be reduced and the chances of a patient going through the attack without serious ill effects were increased. That was quite another matter from assuming that

the prime causal factor had been discovered; it would not do to give up the chase of that causal organism, whatever it might be. With reference to the biological products of animal origin, he thought they could be abused, and it was the ill-effects which followed abuse that prejudiced people against their use. He thought the use of adrenalin properly along with cocaine made it less necessary to use larger amounts of cocaine; it must be used with care and caution, because if used too strong, healing was considerably retarded and in some instances considerable sloughing was produced round the immediate operation area. Better results as a whole could be obtained by resorting to the injection of a more dilute solution round about the area to be operated upon, rather than into the structures which were to be operated upon, and it was a mistake to imagine the operation could be improved by using adrenalin stronger. Pituitrin was a very useful agent, particularly in connection with uterine inertia. In cases of delayed parturition in the smaller animals where the trouble appeared to be solely one of inertia, pituitary injections stimulated the contractions of the uterus and were of very great value. It had been said that some of the products were of service in nervous conditions in the dog, such as chorea, and he should like to know whether that was so, and if so, which of them. The subject of vitamines was an important one, but he thought there was a danger of allowing enthusiasm to run away with judgment. The old methods of feeding had answered well, animals having been conditioned and trained, or fattened, without special resort to vitamines, because the methods of feeding had been used which had been justified by experience. Possibly one important reason was that unknown to us they contained the necessary vitamines. Rickets was said to be solely a deficiency disease resulting from the lack of fat soluble vitamines. That might be so, and long before vitamines were talked about, the best results he ever obtained in the treatment of rickets came from the use of a combination of cod liver oil and other agents. But how could one explain the case where one or two members of a litter of puppies were very badly affected with rickets, while other members of that same litter, fed absolutely similarly, were perfectly sound and well. Such cases made it rather difficult to assume that the absence of vitamines was the only cause of rickets. With regard to Colonel Williams' remarks, it had been suggested a long time ago that the intestinal parasites in horses produced a large amount of their ill effects by means of toxic substances which caused hæmolysis. There was an intense anæmia. When the parasites were removed with chenopodium, it took some little while before the balance could be restored and the patient could turn the corner. He generally had good results in treatment by giving a well balanced diet after the use of chenopodium, and he doubted if one was justified in assuming that the improvement was due to vitamines.

Captain KIRK, referring to the chart, which had been thrown on the screen depicting the various sera arranged into columns according to their recognised values, said he had not noticed anti-distemper serum in the list. He asked Dr. White whether this omission was a consequence of his (or his firm's) lack of confidence in it? He also observed that as the anti-serum was obtained solely from the blood of *horses* immunised against *bacillus bronchisepticus*, was it a fact that dogs could not be so successfully hyperimmunised? He realised that the output of dog serum would be comparatively very small, but thought if a more certain product was the result, the dog-owning public would have no objection to paying a higher fee per dose. Professor Wooldridge had said that the *bacillus bronchisepticus* was merely a secondary invading organism in distemper. Without holding any brief for the organism, Captain Kirk wished to point out that Dr. Ferry had positively produced typical symptoms of distemper by its inoculation into healthy dogs (not once, but hundreds of times), and he considered that would be impossible if the bacillus was merely subsidiary to the disease.

Mr. BOSWORTH asked Dr. White his method of microscopical examination of the diphtheria bacillus, because he had tried to distinguish the organism under the microscope from certain of the diphtheroid group and had failed to do so. With regard to the use of anti-streptococcus serum in treatment of joint-ill, he would like the author to see the statistics of the experiments which had been carried out on a large scale at the Royal Veterinary College, which seemed to indicate conclusively that anti-streptococcus serum was absolutely useless in treating joint-ill in foals.

With regard to the lecturer's statement that "blacklegoids" are an attenuated culture, he would like to ask him what he meant by an attenuated culture, and whether there were any statistics indicating the proved value of anti-distemper vaccine and the *bacillus coli* vaccine. On the question of vitamines he wondered whether any theory had been advanced as to how the vitamines produced their effect.

Colonel WILLIAMS, replying to Professor Wooldridge's remarks, said it appeared to him at the time that the animal had some defective nutrition trouble in addition to the presence of parasites. The number of parasites that came away was nothing compared with what one saw from animals not showing such a loss of condition. The blood, on examination, was found to be normal. As various diets had been tried without results, the question of vitamine feeding was considered, and he believed the special diet, roots, etc., had a good deal to do with the rapid putting on of condition.

It appeared to be a case of finding a diet of which the animal could make full use, and whether due to the presence of the so-called vitamines or not, the result of the special dieting was excellent.

The PRESIDENT (Mr. Livesey) said he had used pituitrin first in 1909, and had recommended it to a great many friends and it had proved of value,

but a good deal of caution was required in its use. It if was given in too large a dose or in an unsuitable case there might be rupture of the womb. He recommended it to a doctor who had never tried it, who used it afterwards with very marked success in *post-partum* hæmorrhage and said that one could distinctly see, after the injection, the uterus contract and that when that contraction occurred he could leave his case with the certainty that there would be no hæmorrhage, and that there would be a recovery in the normal way, He made it his constant practice in every case now to give a small injection of pituitrin before leaving the case. It was a hint worth knowing in veterinary practice, because probably exactly the same conditions would hold good. In a case where there was doubt as to flooding it would be safe to give a dose of pituitrin and get proper contraction. He agreed with Professor Wooldridge about distemper. He had never looked on the Ferry organism as the true causal organism of distemper in this country. Undoubtedly there were many who might acknowledge that there were definite outbreaks of Ferry distemper, but to say that all cases were Ferry distemper, he thought was wrong. He did not believe the cause of distemper was known, but it seemed to him from a clinical point of view to be undoubtedly a mixed infection. The lecturer rather weakened his case for the Ferry organism when he said that he obtained his best results by a mixed injection with *streptococcus* and *staphylococcus*, because he at once divided the honour between three organisms; there was not yet sufficient proof that the *bronchisepticus* was the "*fons et origo*." He thought there was not much doubt that the Ferry bacillus was practically a constant inhabitant of the dog's smaller bronchi. He was of opinion that the majority of cases of simple distemper were not recognised by one out of fifty practitioners or breeders until some secondary infection supervened. He believed a dog with distemper infection could be so near to normal that it would be almost impossible to say he was a sick dog. A pustular eruption gave an indication to look out for the serious trouble which came later. A very interesting letter had appeared in the *Veterinary Record* of the previous week, which every member who was interested in dog practice should read very carefully, and see if he could satisfactorily answer the question put in that letter. It was a case where a bitch was shut up in apparently perfectly good health on arrival and was scrupously protected from any possible infection, but went home and in a day or two had distemper. In the opinion of another veterinary surgeon, the distemper was contracted during its stay at the veterinary hospital, which would raise all kinds of legal questions as to damages.

He congratulated Dr. Stanley White on presenting one of the most interesting papers he had ever heard read before the Society.

The Reply.

Dr. White said the most interesting parts of the discussion were the questions, which if he were to start to answer in detail, would necessitate a lecture all over again. He had been interested in what Colonel Williams had had to say. Very much had been done with regard to protozoa. Colonel Williams' experience with mixed *streptococci* and *staphylococci* vaccines had been borne out over and over again, and he thought it proved very definitely that prophylaxis was something that the veterinary profession had to do or else someone would do it for them. It was interesting to note how the veterinary profession was taking to modern treatment; it was a much easier matter to persuade a veterinary surgeon to use a vaccine than it was to persuade a doctor to try it on a human case. The importance of bacteriological work in veterinary practice was enormous. One of the most valuable horses in England at this moment had a streptococcal infection in his blood stream. Anti-streptococcus serum was ordered to be given intravenously every six hours, but the veterinary surgeon in charge absolutely refused to have anything to do with such treatment. Needless to say that horse had no chance. He was much obliged to Professor Hobday for his kind remarks; it was a great pleasure to have such appreciation from so eminent a member of the profession. He had much enjoyed what Professor Wooldridge had said. The term vaccine was applied as Professor Wooldridge suggested in veterinary circles, but in America they never used the term, except when referring to products containing live, but attenuated organisms. He was not sure that manufacturers of these products ought not to recognise that the term "bacterin" was one of which the veterinary profession here did not make use. Phylacogen was not a vaccine, but a bacterial derivative, based on the theory of mixed infection; no organisms were present because the final product was filtered through porcelain. Such a product was not a serum, because it was not developed in the body of an immunised animal, and not a vaccine or bacterin, because it contained no organisms alive or dead. He was not responsible for the list which had been shown on the screen, showing that one serum would produce results and another not, and he quite agreed it required editing. He had not had much experience of anti-anthrax serum in veterinary medicine, but had used it twice in the human being. In the second case, although the patient had gone past the malignant pustule stage he had good results. With regard to the early use of serum, that was most important. Prophylactically a thousand units of anti-tetanus serum were quite sufficient, some authorities even cut it down to 500 units. Once the animal was infected the serum should be given as quickly as possible. 10,000 to 20,000 units were used and in America it was used intravenously, administered very slowly and the results were quite good. With regard to blackleg immunisation he was not quite convinced that aggressins and blackleg filtrate were, as yet, absolutely satisfactory. Although the products were on the market and produced results he was not yet satisfied that the ideal product

had been obtained. Expert workers were still carrying out researches on the subject. As to whether Ferry's organism was the primary etiological factor in distemper he could not say. He had seen, and been very much impressed with, Dr. Ferry's work. He had not thought of the condition as being a possible "Ferry distemper," he would write Dr. Ferry and tell him the opinion of the members of the Society. The reason why the pure culture of *bronchisepticus* was not now available as a vaccine was owing to the fact that it was thought that quite early in the disease there were secondary invaders, and it might be an admission that they were not sure the *bronchisepticus* might be the cause of the trouble, although Dr. Ferry was convinced that it was the primary etiological factor. After what had been said by the President and Professor Wooldridge, he was wondering whether the minute bacillus he had seen in an American laboratory, and which was probably the cause of influenza in the human being, might not play a part in the disease. With regard to adrenalin, he had not had much experience of chorea in dogs, but had treated dozens of patients in hospital, and it had never occurred to him that chorea might be due to some endocrine deficiency. Nearly always in the human being there was rheumatic history, but whether that was so in the dog he did not know. It was the cause of 90 per cent. of cases in children. It was not quite known what vitamines were. Vitamine A. contained a nitrogen group and was probably alkaloidal in nature. Water soluble B. vitamine seemed to belong to the pyrimidine group, while the water soluble C. had baffled all attempts at analysis. There was actually on the market at the present time a concentrated extract, by the name of metagen, which was standardised, and it might be interesting to see what could be done with this product in smaller animals. As to rickets, the work of the Mellanbys certainly suggested that the fat soluble A. was probably the cause of the disease, although probably not altogether. According to Professor Noel Paton, of Glasgow, vitamines had nothing to do with rickets—it was largely a question of hygiene and fresh air, but that did not quite explain why a litter might contain one dog that was rickety. He thought the explanation was probably along the lines of the ductless glands, and that was borne out by what the President had told him, that such animals did respond to thyroid treatment. It was known that the parathyroids, about the size of a pin's head in the human being, were absolutely essential to life, and in some way controlled calcium metabolism, and he believed calcium in an ionised form played a part in rickets, in addition to vitamines. With reference to Mr. Kirk's remarks as to why an anti-distemper serum could not be made with the use of dogs, the difficulty was that the majority of people who made sera on a large scale were not philanthropists. Sometimes the manufacturers had to work for years without getting any reliable product. For instance, they had worked at a serum for swine fever or hog cholera for about ten years and at the end of that time decided it was not worth the bottle it was put in, although that ten years' work cost thousands of pounds. He would send along the statistics *re* antistreptococcus serum in joint-ill, asked for by Mr. Bosworth. With regard to the question as to what was an attenuated culture, he took it that it was one that had been grown under unnatural surroundings, or cultures might be attenuated by exposure to higher temperatures. As to how the vitamines acted, the general opinion among experts was that they were catalytic in action, but it was for the future to decide. With reference to the President's remarks he should have much pleasure in writing a friendly letter to Dr. Ferry, telling him that the veterinary profession in this country did not seem to be convinced that his organism was the primary etiological factor.

On the proposition of Mr. J. E. Willett, a hearty vote of thanks was accorded to the lecturer.

A Plea for Fresh Solutions of Tartar Emetic in Treatment.

By F. G. Cawston, M.D. Cantab., Durban.

The success which has attended the treatment of the three commoner *schistosoma* infestations of man by intravenous injections of tartar emetic suggests that this drug will prove of similar service in *fasciola* infestation and other parasitic affections of cattle.(1)(2).

I have obtained the best results from the antimony treatment when the salt is dissolved in boiling salt solution immediately before each injection. Stale solutions are certainly less toxic, but there is the danger of them containing fungus formation, and they would appear to be much less effective in eradicating the parasites. Bigger doses of the sodium salt can be given, but I have not found any preparation of antimony more effective than the cheap and readily obtainable tartar emetic powder (3).

Ten grains can be added to 20 c.cm. of saline in a wide-mouthed test-tube and dissolved by boiling. This renders the solution sterile. It can then be drawn up into a sterilised syringe and injected into the vein before it is quite cold. By giving these injections on alternate days for a month it is possible to effect a permanent cure for *schistosoma* infestation by smaller doses than are generally advised where the solution is kept for some hours before use. Farmers in parts of Zululand have been receiving solutions of tartar emetic by rail; such stale solutions of the drug, like solutions of arsenic that are kept, are unlikely to produce the same effect that freshly prepared solutions might well be expected to do. In certain instances such a procedure may be the only possible one for farmers, but wherever possible the powder should be dissolved on the infested farm. The older solutions of antimony have also been used with but little success in syphilis; but I have recently had very encouraging results from the treatment of various forms of syphilis with freshly prepared tartar emetic solution. Colloidal antimony is also of

service here, but colloidal preparations remain for so short a time in the system if given intravenously that, even in systematic infections due to blood parasites, it is probably best to use the intramuscular route (4).

The reports of the value of antimony in the treatment of trypanosomiasis in various animals are very varied, and it is very probable that the success obtained varies more with the freshness of the solution than with the amount of the drug administered. I am hoping that these principles will shortly be given a fair trial amongst the nagana-infected cattle of Zululand, where Mr. H. H. Curson, M.R.C.V.S. (in spite of the malaria of the district) is heroically working at a solution of the problem. If fresh solutions of tartar emetic are given in increasing doses until the largest dose an animal can comfortably stand is given on alternate days with the object of keeping the animal well under the influence of antimony for a continuous period of a month, I do not think we need fear any of the dangers of perishing parasites or of the parasites becoming antimony-fast, as is suggested when the drug is given less frequently over a longer period; nor is there the likelihood of the trypanosomes migrating to some out-of-the-way portion of the system where the drug would be unlikely to reach them.

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(1) *Journal of Tropical Medicine and Hygiene*, Vol. XXIV., No. 19, pp. 254, 255. October 1st, 1921.
(2) *British Medical Journal* for October 8th, 1921, p. 551.
(3) *The Lancet*, Vol. CCI., No. 5125, pp. 1049, 1050. Nov. 19th, 1921.
(4) *The Veterinary Record*, Vol. 33, No. 1735, pp. 816, 817. October 8th, 1921.

The Granting of an Honorary Degree by the Veterinary Colleges.

By J. D. Pottie, M.R.C.V.S.

There should be instituted something for the ordinary veterinary surgeon to aim at in the form of a degree for distinctive work in the various branches of veterinary science. This degree would in no way interfere with any of the present degrees, and would be for merit in practice or research work, and free from all examinations whatever. The busy practitioner has no time to go in for examinations, and this degree would provide some inducement to endeavour and something to aim at in life. The expenditure would not be great, only parchment presented to so many selected graduates each year. The degrees could be conferred by the senators of each veterinary college or its committee of management, selected by vote or by recommendation of the National Veterinary Medical Association or any other group of Veterinary Associations each year. This would lead to new ideas and new inventions of instruments for operations, etc., and would give a fresh impetus to the ordinary members of the profession.

At the present time there is no inducement whatever to excel in veterinary science apart from examinations. Merit in any branch of the veterinary profession remains unrecognised in any way. A committee of the "National" should consider this new suggestion, and each veterinary college should take this matter up for its own benefit and that of its many graduates. It would bind the graduates together, and give them some reward to which to look from their *Alma Mater*. There is at present too much jealousy amongst members and colleges; instead of this, they should vie with each other in promoting progress in the profession.

I hope to see this humble suggestion of an ordinary member of the veterinary profession taken up and discussed at the forthcoming meeting of the National Veterinary Medical Association this year at Bath and carried into practice.

The Ancient and Modern Theories of the Causation of Rickets.

By Henry Gray, M.R.C.V.S.

In the *Veterinary Record* of March 25th there is an abstract from *The Times* giving a summary of observations made on rickets in pigs and sheep which goes to show that the vitamin theory is at fault in the ætiology of rickets. I have on several occasions in the veterinary and lay press expressed the opinion that food had very little if anything to do with the actual cause of the malady, as I had seen the disease arise in dogs, poultry, goats and pigs that were fed on foods containing an abundance of vitamins and lime salts, but that were not allowed any free exercise natural for the proper development of young animals, especially of the heavier improved breeds, during the period of rapid growth. As I have dealt with this question in an article on "Rickets," in vol. II. of Hoare's System of Veterinary Medicine, I will not labour the point, but I earnestly ask members of the profession who must have had excellent opportunities of observing the disease and the conditions under which it arises in actual practice to state their facts and to give their conclusions thereon. I may mention, in conclusion, that nearly every veterinary writer for more than a century has drawn attention to the preponderating influence of lack of exercise had in the causation of rickets, referred to by continental writers on the disease in children as the "English Town Disease."

Foot-and-Mouth Disease.

Conference of Scottish Agriculturists.

A conference called by the Ministry of Agriculture and Fisheries was held on April 3rd, in the Highland and Agricultural Society's Hall, 3 George IV. Bridge, Edinburgh, of representatives of the Highland and Agricultural Society, the Scottish Chamber of Agriculture, the National Farmers' Union of Scotland, and of the county local authorities concerned to consider the working of the new Order of the Ministry providing for the return of sheep from wintering quarters to their summer grazings, subject to certain conditions and limitations. There was a large attendance of stockowners, the gathering numbering about 200.

The Earl of Ancaster, Parliamentary Secretary to the Ministry, presided, and he was accompanied by Sir Daniel Hall, K.C.B., F.R.S., chief scientific adviser of the Ministry; Sir Stewart Stockman, chief veterinary officer; and Sir Robert Greig, chairman of the Board of Agriculture for Scotland.

The Outbreak in Hand.

The Chairman apologised for the absence of Sir Arthur Griffith-Boscawen, the Minister of Agriculture. During

the last month they had been pressed and also had had personal interviews with a very large number of agriculturists who had brought to the notice of the Ministry the very important question involved in this large movement of sheep. The Ministry had found this a most difficult matter to deal with. The whole outbreak of foot-and-mouth disease had affected forty-three counties in Great Britain, and the outbreaks numbered 1,057. But from the high-water mark of 293 in the week from March 5th to 11th they had been brought down to twelve in the last week of March. That showed that they had at least got the thing well in hand, and that with care and attention it would not be long before they could declare once more the whole of the United Kingdom free from disease. (Applause.) But they would also understand that the Ministry were very loth to release any of their restrictions whatsoever. Still they had to consider whether it was better to run some risk or to throw absolutely out of gear the whole system of farming and the whole practice of farming among the sheep farmers in the Highlands of Scotland, and also affecting the farmers in the low country, who had these wintering sheep still left on their farms. In view of all the circumstances they felt they were justified in running some risk, and after due consideration the Ministry had come to the conclusion that they would be able, subject to certain restrictions, to allow a large number of these sheep to return from their wintering quarters to the hills. They had freed a large number of counties in Scotland from which movement was not allowed to take place. They had been able to extend the scheduled districts by including some of the districts which were infected, and what they intended to do further was that in the scheduled districts the sheep that were wintering in these districts were to be allowed to be moved back to the hills, but there must be a licence from the authority whence they came and also the authority to which they were sent.

Taking the Risk.

In addition, the sheep must be inspected by a veterinary officer before they were sent away and again on their arrival. They asked that meeting of agriculturists to do their best and make this risk as small as possible. They asked every local authority to be as careful as they could in carrying out strictly the Order as it was set out, and in no case to yield to any influence or to make Orders where they did not consider it was safe. Also they asked all veterinary officers to be most careful in their examination, and, if there was any reasonable doubt, to turn the matter down for a day or two rather than move sheep which might be infected. In short, he asked everybody connected with this great movement to play the game. If once the hill lands of the big sheep places were infected it would almost have to be a policy of "allowing it to rip." It meant that next August none of them would be able to send lambs to the lamb sales and markets would be closed in the Highlands for two or perhaps three years.

Sir Stewart Stockman said they must not think because an area was scheduled to-day it would be scheduled to-morrow. They had got to the stage when premises were about to be freed, and week by week they hoped to publish an Order freeing certain areas now infected, putting them into scheduled areas and putting scheduled areas into the free area. One of the greatest difficulties in freeing areas was the cutting of counties in two, for at once they raised all sorts of administrative difficulties.

Mr. G. Findlater, Jerviswood, Lanark, asked if it were not possible to get sheep removed from a place eight or ten miles from an infected place into a free area.

The Chairman: Not if it was in an infected area.

Sir Stewart Stockman said the only way they could help Mr. Findlater was to hurry on the freeing of the area in which he was.

Mr. Findlater instanced a case in Mid-Lothian where an outbreak had occurred after restocking had taken place. He understood the restrictions were withdrawn from the premises by the local authority.

Sir Stewart Stockman said the Ministry did not withdraw the restrictions. He was informed the local authority withdrew the restrictions, but Mr. Asher stated that was not the case.

Mr. Findlater: You will be taking steps to find out?

Sir Thomas Munro said it was quite true, as pointed out by Sir Stewart Stockman, that there was great difficulty in differentiating between the infected area and the free area. The whole crux of the difficulty was where the Ministry was to draw the line. The policy must be fairly broad, and they must not simply confine the movement to the areas that happened to be free or the scheduled areas. The Ministry would have to consider from week to week the relaxation of these areas which were infected areas. As long as they had that assurance it would relieve their minds.

Position in Berwickshire.

Mr. Alexander Lyal, Gordon, Berwickshire, said there was a large border line between Berwickshire and Roxburghshire, and according to the latest Order no stock could be removed from Berwickshire into Roxburghshire. The west end of Berwickshire was twenty miles at least from the outbreak at Coldingham and Lumsden. How long, he asked, could that Order stand if the outbreak at Coldingham and Lumsden was to be tested with isolation. They might be held up in the west end of Berwickshire for months. There were something like 4,000 acres on these two farms, and yet the policy of isolation was taking place there. The position would be as bad as predicted by Sir Stewart Stockman in the hills in the Highlands. The whole of the west district of Berwickshire was not within ten miles of any outbreak in Berwickshire, and yet they could not move an animal.

Sir Stewart Stockman said things were not stable in Berwickshire. For all they knew there would be outbreaks jumping about. As soon as the position was stabilised, and they knew they had got the disease tied up, they would relieve Berwickshire and let it come into the clean area.

Mr. Thomas Elder, Haddington, said he sympathised with the condemnation of the method in which the Ministry included full counties. East Lothian was within seven miles of one of the infected areas, and they could remove stock from over the border within seven or eight miles from an infected place, whereas in Berwickshire they could not do so within twenty to thirty miles. He thought the Ministry ought to take into consideration the great feeling that existed among agriculturists at present to have an area going round an infected place rather than to include counties. (Applause.)

Mr. John Elliot, Meigle, suggested that wherever they had a disease centre they should draw a cordon round it. The simplest plan was when an outbreak took place that the area ought to be a large one, and it could be reduced week by week if desirable. Why should not the Ministry, if they approved of Scottish opinion, proclaim infected areas and allow the rest of the country to go free?

Small Areas.

The Chairman said the past policy of the Ministry always had been to draw a circle wherever they had an outbreak. There had been a radius of fifteen miles, and that area was an infected area, and no movement could take place. Then that area was gradually contracted. That had always been their policy in the past until this large outbreak. When it came to a position like the present outbreak the policy of drawing a circle and of exactly knowing where the circle would go was almost impossible, and the Ministry had to deal with it on more general lines. When they were faced with this outbreak they had to act as best they could and in the quickest way, and they thought the best way was to act by counties.

Sir Stewart Stockman said their whole aim from the start had been to get back to the small area, and an Order was under preparation which would deal with areas and try and get back to the old circle, and it would be a smaller circle.

THE END IN SIGHT.

Mr. William Henderson, Lawton, said a large enough area was not scheduled to begin with, and if it had been large enough the disease would not have attained the dimensions it had. He thought it was unfortunate that they had these isolation areas still in Scotland. When once the policy of slaughtering was entered on it should have been pursued to the end.

Mr. W. Elliot, Lanark, thought the Order should be put back from the 5th to the 10th. He raised the question of sheep which had been wintered by the farmer, and who, having wintered them, wanted to sell.

The Chairman said a great many people with sheep in the scheduled areas would be very sorry to see the Order put back. (Applause.)

Sir Stewart Stockman, replying to Mr. Charles Middleton, Chief Constable of Stirlingshire, said if that county went on as they were doing they would not be long in the infected area.

Mr. Peter M'Intyre, Tighnablair, suggested that if sheep were examined by a veterinary inspector before being put on rail there was no necessity to have them inspected on their arrival. If they were unable to release those areas during the next two or three weeks it would mean very heavy loss to the farmer.

Mr. A. Wilson, Renfrew, asked when their county was to be freed.

Sir Stewart Stockman said Renfrew had had sixteen outbreaks, and the last was on March 4th. The difficulty about holding up the county through one outbreak was cutting the county in two.

Sir Hugh Shaw Stewart, Bart., pointed out that for administrative purposes Renfrew was cut in two.

Sir Stewart Stockman said that might make it much easier.

The Chairman thought it would be most saitsfactory to get back to the old system of the circle, and he would have pleasure in putting that before the Minister. They wished to do their best to enlarge the scheduled and the free areas where they thought they were not running an undue risk. He only wished they could have come down there and declared the whole country free, but he really thought that perhaps in a month, if they had no fresh outbreaks, they would be declared free again. (Applause.)—*Glasgow Herald.*

NEW TUBERCULOSIS VACCINE FOR BOVINE ANIMALS.

Mr. Ford asked the Minister of Agriculture if he was aware of the alleged discovery by the Pasteur Institute, of Lille, of a vaccine for conferring immunity from tuberculosis on bovine animals; and, in view of the fact that the Pasteur Institute was so largely supported by the French Government as to be almost an official department, would he consider the advisability of requesting his colleague at the Foreign Office to institute suitable inquiries of the French Government with a view of enabling the treatment to be introduced into this country as soon as possible.

Sir A. Griffith-Boscawen replied: The answer to the first part of the question is in the affirmative. I understand, however, that the investigation is still in an experimental stage, and the action suggested by my hon. friend would be premature at the moment. The progress of the investigation is, however, being carefully watched by the Ministry.

The Veterinary Record.

15th April, 1922.

R.C.V.S. QUARTERLY MEETING OF COUNCIL.

The reports of the Meetings of Council of the Royal College, which were held from the 5th to the 8th inst., will be read with interest by all who have the welfare of the profession at heart. Two whole days were occupied by Committee Meetings, but the proceedings at the Council Meetings were not prolonged.

The increased use made of the College Building has necessitated the installation of central heating, and on the recommendation of the Finance Committee the Council had appointed a small Sub-Committee to carry out the work.

We heartily endorse the comments made in Council on one part of the report of the Registration Committee, namely, that when a member makes a charge of unprofessional conduct against another member, he should be called upon to substantiate the charges in person before the committee. The fact that in the case in question a judgment of "not proven" was recorded serves to emphasise the obligation that lies on the accuser to make good his accusation, otherwise while himself going scot free, he is not only wasting the time of the committee, but is placing on his brother practitioner a heavy burden of expense and trouble in rebutting a charge for which he has failed to supply sufficient evidence.

The Report of the Parliamentary Committee shows, among other matters watched on behalf of the profession, that consideration has been given to Bills in Parliament, Departmental Regulations, and conditions of service in the R.A.V.C. The letter from the War Office shows that concessions have been obtained, though not all that was asked for. The War Office decision must perhaps be taken as final for the present.

The Examination Committee has decided that no fresh application for concessions on account of War Service shall be entertained after the 30th September next. This is a wise decision, which, however, we note will not apply to veterinary students who are already in attendance.

We must congratulate the profession on the decision of the Council, on the recommendation of the Treasurer at the Library Committee, to allocate £100 a year for the maintenance of the Library.

This is one of the first-fruits of the new Act, for the money is to come out of the Annual Fee Account. To our mind no money that the Council spends could be more wisely employed than by the provision in the Library of a permanent home for all important literature produced by the profession. This is but the beginning of what will undoubtedly be for the ultimate benefit of the profession as a whole.

The decision of the Council at the Special Meeting to fix a date for the coming into operation of the revised list of preliminary examinations was reached unanimously, and will give satisfaction, we are sure, to all concerned.

The "Anti-Anthrax" Station.

The hundred thousand pounds' disinfecting station at Liverpool for the treatment of infected imported hides and wool has apparently had a most inauspicious start, and the Home Secretary announces that it has been and is working at a loss. Unless conditions change within the next six months, the station will be closed temporarily. The falling off of supplies has materially affected the working. Two ways in which the continuance of working may be ensured are by an increase of revenue from fees and by means of a subsidy from the trade. There does not seem to be much likelihood of either yet awhile. Cost of treatment is already regarded as high by the trade, and any demand for financial help in that quarter would probably not be entertained with any favour. Whether there will be such an increase in imports of scheduled goods as would meet the circumstances also is doubtful, so that the temporary closing of the station would appear to be inevitable.—*Textile Mercury.*

Tumours in Ethmoid Bones of Horses.

In a recent congress of pathologists at Stockholm, Sweden, Henschen, of Stockholm, demonstrated specimens of tumours grown in the ethmoid bones of horses. During the last few years this disease had assumed an epizootic character in Sweden, and was included with diseases which the veterinarian must report. Clinically, the disease started as an acute suppurative rhinitis, which became chronic and assumed a hæmorrhagic nature. Later, several tumours became visible. The histologic examination of each growth shows a number of tumours of different character; side by side occur carcinoma, adenocarcinoma and papilloma. The multiple appearance of the tumour, its polymorphism, the clinical history and the presence of lymphoid cell infiltrations make one believe that the etiology may be an organised virus. No attempts to demonstrate this nor any transplantation experiments have, however, succeeded.

Abstracts and Reviews.

Coccidiosis in Pigeons.

The organism responsible for coccidiosis in pigeons is the *Eimeria pfeifferi*. The oocysts are more or less spherical in shape and from 16 to 18 microns in diameter. The disease, which is characterised by an intense and very fluid diarrhœa, may occur in a serious enzootic form. The author examined large numbers of pigeons during the early summer of 1921 which succumbed to a mysterious affection. The period of illness was from 8 to 10 days, and the only clinical symptoms were those of diarrhœa. In one breeding establishment, however, the birds showed nervous symptoms manifested by huddling together in a circle with their heads towards the centre.

The feathers of the dead birds were dull in appearance and soiled, those round the vent being stuck together with fæces. The skin appeared tight, with the bony framework prominent and extreme emaciation. On opening the abdomen the appearance of the mesentery was striking, being of a dark violet colour due to intense congestion of its network of blood-vessels. The intestine was distended with gas, and on opening was found to contain a watery greyish material. The peritoneal congestion was reminiscent of a microbial infection, but the blood proved sterile on attempted cultivation.

Examination of fæces revealed the presence of coccidia of the size and shape of *E. pfeifferi*. This organism may easily be overlooked when searching with a low power of the microscope, for it appears smaller than the length of a red blood corpuscle and less refractile than the grains of starch which accompany it, and indeed it is only detected with care. If possible it is an advantage to dilute the secreta with a solution of eosin and leave it in contact for 10 to 15 minutes. On a rose-coloured background the blood corpuscles appear quite red, starch grains are uncoloured and coccidia are of a pale rose tint.

With regard to treatment, ordinary preventive measures should be applied, and affected birds may be given teaspoonful doses twice daily of weak solutions (1 in 500) of either thymol or tannic acid.

[*Rec. Med. Vet.*, 1921, Aug. 15th, Vol. 97, No. 15, pp. 450-453.] T. J. B.

Immunisation against Blackleg with Germ-free Filtrates.

From a series of experiments on the immunisation of guinea-pigs, sheep and cattle against blackleg, the authors conclude that a single subcutaneous injection of blackleg filtrate produces an immunity which protects the animals against double the ordinary fatal dose of virulent blackleg material. A second inoculation with the attenuated virus which is not fatal to normal animals, but in itself produces only slight immunity, greatly increases the immunity produced by the filtrate. It is considered that the immunity is not only active and lasting against the

strain used for the preparation of the filtrate, but against other strains as well. In practice, the single immunisation with blackleg filtrate is recommneded for cattle which are exposed to blackleg infection only during the pasture season and the double method for animals continually exposed to infection. Inoculation with the virus should be given not earlier than ten days nor later than two months after the filtrate inoculation.

[GRAUB, E., and ZSCHOKKE, W. *Schweiz. Arch. Tierheilk.* 62 (1920), Nos. 2, pp. 52-65; 3, pp. 112-122. *Abs. in Exp. Stat. Rec.*, Vol. 45 (1921), p. 180.]

Clinical and Case Reports.

The Editor will be glad to receive from members and others contributions to this column of reports of interesting cases.

Parasites of the Grant's Gazelle.

By J. MALCOLM ARMFIELD, M.R.C.V.S., Tanganyika.

Perhaps some of our colonial confrères will be interested in the following report and be kind enough to furnish further particulars, if they possess them.

Subject.—Grant's Gazelle, fully-grown male specimen.

Post-mortem revealed everything normal except the abomasum. This contained about a dozen protuberances about the size of a walnut. On section each was found to be densely packed with worms. These were some two inches in length, with a diameter equal to that of stout thread. They were coloured bright red, presumably from ingestion of blood. The host was examined an hour after it had been shot, and apparently otherwise was in perfect health.

MEASLES IN GRANT'S GAZELLE.—I have never found any cysts myself in the muscular tissue of this species, but many sportsmen of experience have informed me that the flesh is frequently "measly"; some go as far as to refuse to eat meat from this animal.

It is quite a common occurrence to come across *cysticercus bovis* in bovine carcases inspected at the slaughter-houses in this country. The question therefore arises—are game ever infected with this parasite? If not, do my friends refer to some distinct species of cyst?

The flesh of hartebeest and other game is reported to be "measly" on occasion.

Lead Poisoning in a Cat.

By WM. C. MILLER, Royal (Dick) Veterinary College, Edinburgh.

Subject.—The subject of this case was a black female cat aged about three years, and nursing two kittens between two and three weeks old.

History.—The cat was brought to the College hospital late on the night of the 23rd April, 1921. It had been in an exhausted state for about four hours, but beyond suspecting that it was poisoned, the owner could offer no information of a helpful nature.

Symptoms.—The animal was quite unable to stand, but maintained a more or less upright position on its sternum with some difficulty; inco-ordination of the skeletal muscles was marked, and spasmodic contractions and quivering movements were noticed in the limbs. Salivation was excessive, but the mouth showed no determinative lesions. The owner stated that emesis had occurred before admission to the College. The pupils of both eyes were very dilated, the pulse rapid and weak, the breathing was fast and laboured, and there were signs of abdominal pain on manipulation of the region of the stomach. No characteristic smell was noticed. No fæces or urine had been passed since the illness commenced about four hours previously.

Treatment.—With difficulty the cat was dosed with the following mixture before it left the College:—R.: Liq. ammon. acet. conc., spts. æther. nit. aa m. x., aquæ ad ℥i.; and as the owner wished to take the cat home, she received a bottle containing one dram of chloral hydrate dissolved in an ounce of water with a little treacle added, and was told to give one teaspoonful every two hours. Instructions were given as to the general comfort of the animal, etc.

The case was visited the next day, and the animal was found in a dazed state; no food had been taken, neither fæces nor urine had been voided, and the cat displayed no interest in her kittens. These were clamorous for milk, but unable to feed, as the cat still maintained her upright position on the sternum. Abdominal pain was still marked, salivation was still in evidence, and she was still unable to stand. On supporting the weight of the animal complete paralysis of the extensor muscles of both fore-limbs became evident, the limbs becoming flexed at the carpus. Upon inquiry the owner stated that painters had been at work in the house for the past week, and that she had noticed the cat licking up spots of white paint from the floor. She had not thought fit to speak of this before, as she did not attach any importance to it.

On the strength of the symptoms along with the information concerning the spilled paint the case was diagnosed as one of lead poisoning.

The following mixture was obtained from a chemist's shop and given at once:—R.: Magnes. sulph. grs. xv., ac. sulph. dil. m. iii., aquæ ad ℥i. Instructions were left that this drench be repeated every six hours.

On the next day the cat was much better, sitting up on its fore-limbs and buttocks, and nursing its kittens. The salivation had ceased, and it had taken a little warm milk. The bowels were purging and urine had been passed. Mouth and tongue were slightly inflamed and appeared somewhat sore. The kittens were normal. The owner was advised that the medicine be given twice daily, and that the feeding be restricted to milky substances.

Advice was received the next day to the effect that the animal was progressing. The bodily func-

tions were almost normal, the kittens were sucking, and the cat was brighter generally. All medicine was stopped and the cat left to itself. The case was seen later, and was found practically recovered. Paralysis had totally disappeared, and the cat was able to jump from the table without any difficulty; food was being taken, although the appetite had not completely returned. The cat ultimately made a total recovery.

This case is remarkable in that, firstly, from the symptoms an observer might be led to the conclusion that the condition was one of chronic lead poisoning upon which was super-imposed an acute exacerbation; and, secondly, in that, in the earlier stages, it bore a distinct resemblance to strychnine poisoning, and was, in fact, mistaken for that when first seen. It is remarkable that the kittens were not affected, since lead is excreted in the milk (Cushny: "Pharmacology and Therapeutics," 7th edit., 1918, pp. 653; and Milks: "Veterinary Pharmacology and Therapeutics," 1st edit., 1917, pp. 422); and, finally it is interesting on account of the rapidity of resolution after the administration of the antidote.

Association Reports.

The Central Veterinary Society.

The General Meeting of the Central Veterinary Society was held at 10 Red Lion Square, London, W.C., on Thursday, March 2nd, Mr. G. H. Livesey, President, in the chair.

The following signed the attendance book:—Messrs. P. Dayer-Smith, T. J. Bosworth, T. S. Price, H. C. P. King, H. D. Jones, J. Willett, J. W. McIntosh, H. R. Allen, A. E. Willett, F. W. Willett, W. N. Thompson, Professors B. Gorton, G. H. Wooldridge, E. B. Reynolds, Lt.-Col. A. J. Williams, Major Simpson, Capt. H. Kirk, Messrs. W. S. Mulvey, J. Rowe, E. L. Stroud, R. Bryden, A. Barr, P. S. Howard, W. Perryman, J. Seton, Vet. Capt. G. Rees-Mogg, Messrs. W. S. King, H. King, C. Macara Finnie, and J. F. Macdonald (Hon. Sec.).

Visitors:—Messrs. R. E. Glover, H. A. Lumb, T. Maben, T. Redman, G. F. Paterson, D. M. Lloyd-Jones, W. S. Widden, A. Pyle, G. N. Williams, and Capt. J. F. Player.

The minutes of the previous meeting were taken as read and confirmed.

Apologies for absence were received from several Fellows:—Major-Gen. L. Blenkinsop, W. Reekie, F. W. Garnett, Major Dunkin, G. P. Male, and C. R. A. Powell.

Captain J. Player was proposed for Fellowship by Professor HOBDAY, seconded by the PRESIDENT.

The PRESIDENT moved a very hearty vote of thanks to Mr. J. Willett for kindly taking on the acting-secretaryship during Mr. McCormack's unfortunate illness until the appointment of Mr. Macdonald. He said that Mr. Willett went to a great deal of trouble and a lot of personal inconvenience, although at the time he was himself ill.

Mr. MCINTOSH seconded the motion, which was carried.

Mr. J. WILLETT said there was no necessity to thank him for what he had done, as he had only been too pleased to do what he could to help the Society.

Dr. J. STANLEY WHITE then addressed the meeting on the "Biological Products in Veterinary Medicine," the lecture being illustrated by a large number of lantern slides.

[Dr. White's lecture, together with the ensuing discussion, receive separate publication.—ED.]

Mr. J. E. WILLETT proposed a hearty vote of thanks to the lecturer. The same having been accorded and acknowledged, the President declared the meeting closed. J. F. MACDONALD, *Hon. Sec.*

Scottish Metropolitan Division.

The annual meeting of this society was held in the Royal (Dick) Veterinary College, Edinburgh, on Wednesday, February 22nd, at 2-30 p.m. The President, Mr. James Henderson, occupied the chair. The members present included Messrs. J. Aitken, Wm. M. Mitchell, S. Robson, A. Baird, J. Peddie, O. C. Bradley, A. Gofton, J. R. Greig, Wm. C. Miller, A. K. Cameron, J. H. Jones, J. Taylor and R. G. Linton.

Minutes.—Those of the previous meeting having been published in the *Record* were taken as read.

Correspondence.—This included letters of apology for inability to attend the meeting from several members. A letter was read from the Committee of the Malcolm Memorial Fund, asking the Society to contribute to the fund. It was unanimously agreed to send a donation of £2 2s. 0d.

The SECRETARY, in submitting his *Annual Report*, stated that forty-two members had paid their subscription for the year. The accounts which had been audited and passed by the Society's auditors, Messrs. A. Baird and S. Robson, were approved.

Election of New Member.—Mr. T. W. M. Cameron, M.A., B.Sc., was elected to membership.

Nomination of New Members.—Messrs. A. W. Baird, A. B. Kerr, and C. McHattie were nominated for membership.

Messrs. A. Gofton and T. M. Inglis were elected to serve on the Council of the N.V.M.A.

Mr. James Henderson then read his Presidential Address.

In his opening remarks the PRESIDENT thanked them very much for the honour of being elected President of this Society. During the last two years or so the attendance at meetings had markedly increased, and from past experience he thought that was a reaction to the increased interest of the agenda provided. They could rely upon it that in so far as it was open to him, he would do his utmost to maintain and further that interest, and he assured them it would be a great pleasure to him if he could contribute to the success of that object. The Presidential address was one of the penalties of being President. The difficulty was to find a subject which was sufficiently non-contentious to be received

without discussion. Still, in place of dilating upon inconsequent generalities, it was at least his ambition to present something which might be useful to some of them, even if he had to risk encroaching upon that hoary tradition, if he might, and invite discussion.

[Mr. Henderson's paper, together with the ensuing discussion, receive separate publication.—ED.]

After the business of the meeting was concluded, the members and visitors adjourned for tea, which was presided over by Mesdames Linton and Mitchell.

Midland Counties Veterinary Medical Association

ANNUAL MEETING—*continued.*

SPECIMENS.

The following specimens were produced at the meeting by Messrs. R. P. Holmes and G. Howie :—

1.—*Liver of a calf, about 8 weeks' old, affected with bacterial necrosis.*—In the central portion of the liver was observed a large mass of necrotic tissue due to coalescence of several necrotic patches ; whilst towards the periphery of the liver were smaller necrotic areas in different stages of development, some of which were surrounded by a distinct hæmorrhagic or inflammatory zone. No other lesions were found in any part of the carcase of the affected calf, but judging from the progressive development of the necrotic lesions, it seems most probable that the necrosis bacilli had gained entrance to the liver through the medium of the navel at the time of or after birth.

2.—*Liver of cow, affected with bacterial necrosis,* showing several necrotic areas, a few of which were observed to be surrounded by a dark red inflammatory zone. Some of the older necrotic areas had become sharply delineated from the liver tissues by fibrous connective tissue, and these were in a state of caseation, and showed a tendency to break open and discharge pus.

3.—*Liver of cow affected with echinococcus cysts* of the unilocular or polymorphous type.—One of these cysts was opened to demonstrate its structure, when it was observed to consist of two parts: the echinococcus membrane which is filled with fluid, and which is surrounded by a connective tissue capsule formed by a reaction of the surrounding tissue after the invasion of the parasite. On the inner lining of the echinococcus membrane and just visible to the naked eye could be seen numerous scolesces which represent the larval or asexual stage of a tapeworm with three or four segments (*Taenia echinoccus* of the dog).

4.—*Liver of sheep affected with echinococcus cysts* of the unilocular type.—This specimen was of interest from the fact that several of the larger cysts had developed daughter cysts, but in each case the mother cyst, together with its daughter cyst was observed to be of simple structure and surrounded by a connective tissue capsule, in contrast to the multilocular type in which the daughter cyst becomes constricted off and forms a separate unit, furnished with the same reproductive powers as the mother cyst.

5.—*Liver of sheep affected with cysticercus tenuicollis,* which represents the "bladder worm" or larval stage of a tapeworm—*taenia marginata* of the dog. Several "bladder worms" varying in size, could be seen lying beneath the peritoneum and on the outer surface of the liver. In each of the "bladders" could be seen an opaque central spot which represents the scolex or head of the developing tapeworm.

6.—*Liver of cow affected with capillary angiomatosis.*—The chief characters observed in this specimen were the presence of numerous violet-red spots both on the surface and in the deeper layers of the liver tissue, varying in size from that of a pea to that of a walnut. This condition is found most frequently in cows and seems to be closely connected with parturition.

7.—*Piece of lower jaw of a bullock affected with actinomycosis.*—This was an interesting specimen on account of the presence of a large number of the pale yellow granules about the size of a millet seed and so typical of the actinomyces or ray fungus The granules were observed to be arranged in groups, each group being surrounded by a dense layer of fibrous connective tissue.

8.—*Gall stone taken from gall bladder of a pig.* This was obtained from a large sow pig and completely filled the gall bladder: it is approximately 4 inches long and 6½ inches in circumference, and approaching the conical in shape; weight 3¼ ozs.

9.—*Verminous aneurism from the mesenteric artery of a horse,* showing the thickening of the walls of the artery and numerous worms (*sclerostomum armatum*).

10.—*The muzzle and foot of an ox,* showing lesions caused by *malignant catarrhal fever.*—The lesions on the muzzle, dental pad and round the coronary band are very similar to those found in foot-and-mouth disease.

ANNUAL DINNER.

The members subsequently dined together under the chairmanship of the President. The toast list was a very short one, most of the evening being devoted to pleasant social intercourse.

The PRESIDENT gave the loyal toast, which he followed with that of "The Royal College of Veterinary Surgeons."

Mr. C. V. DAVUS, one of the newly-elected members and the son of an old member, proposed "The Midland Counties' Veterinary Medical Association." In a neat little speech he pointed out that the organisation was one of the oldest of its kind in the country and led the way in the expression of opinion on matters affecting the profession. It was never so essential as at the present time, he added, that the profession should be properly organised.

The PRESIDENT suitably replied.

H. J. DAWES, *Hon. Sec.*

Notes and News.

Foot-and-Mouth Disease.

RESTRICTIONS RELAXED.

The Ministry of Agriculture reports that the position with regard to foot-and-mouth disease continues to improve, and it has been found possible to make further modifications in the regulations affecting movement of live stock in England and in Scotland. So far as England is concerned the new Order releases from all restrictions the counties of Warwick, Bedford, Northampton, Oxford, Surrey, and Sussex, and the greater part of Salop, Worcester, and Buckingham. Practically half the total area of England and Wales is thus freed from restrictions affecting movement, although the whole of the northern counties and East Anglia remain scheduled.

The following are extracts from the Order, which is a very lengthy one :—

SLAUGHTER WITHIN 48 HOURS.

Where animals are moved with a licence under the Principal Order or this Order authorising their removal to a slaughterhouse, the animals on arrival at the slaughterhouse shall be detained therein until slaughtered, and shall be slaughtered therein within forty-eight hours of their arrival thereat.

MODIFICATION OF THE PRINCIPAL ORDER AS REGARDS GRANTING OF MOVEMENT LICENCES.

(1) A Movement Licence granted under the Principal Order or this Order shall be granted only by an Inspector of the Local Authority or the district in which the premises to which the animals are to be moved are situate. Except as provided in the Animals (Landing from Ireland) Order of 1922, a licence so granted shall not be available unless and until it is countersigned by an Inspector of the Local Authority of the district from which the animals are to be moved, who shall in every case endorse upon the licence the route by which the animals are to be moved and the date and time of the counter-signature. No licence shall be granted or countersigned by an Inspector of any Local Authority if in his opinion it is undesirable to grant or countersign it, or if the intended movement is to or from any premises situate within a radius of two miles of any place which is for the time being declared to be a place infected with foot-and-mouth disease, or if the intended movement would involve movement on a road which is within a radius of two miles of any such place.

(2) A movement licence granted under this Order shall be available for three days from the time it is countersigned, and no longer.

(3) In the case of every movement of animals uthorised by a licence under this Order, the licence shall accompany the animals throughout the movement.

Lieutenant-Colonel WHELER asked the Minister of Agriculture whether the Department of Agriculture in Ireland had addressed a communication to him in which the Department affirms that Ireland is free from foot-and-mouth disease; and, if so, whether he has any information to show that all parts of the South and West of Ireland have been visited by competent inspectors to confirm this statement made by the Irish Department of Agriculture.

Sir A. BOSCAWEN: The reply to the first part of the question is in the affirmative. With regard to the second part, I have reason to doubt the statements made by the Irish Department of Agriculture.

At their monthly meeting, held in the Head Office, Belfast, the Executive Committee of the Ulster Farmers' Union unanimously approved of the resolution passed by the Finance and Emergency Committee, protesting against the statements made by Mr. Thornborrow and the resolution of the Shorthorn Breeders' Society, with regard to the health of Irish cattle.

It was decided to publicly invite, on behalf of the Ulster Farmers' Union, Mr. Thornborrow and representatives of the Shorthorn Society to visit Northern Ireland, so that they might be convinced that there was no foot-and-mouth disease there.

The Executive at the same time expressed their opinion that the Irish Farmers' Union would afford similar facilities for investigation in other parts of Ireland.

Obituary.

Major S. BLACK, R.A.V.C.

We regret to announce the death of Major S. Black, R.A.V.C., who died at Nowshera, India, on the 16th March, 1922, from concussion, due to a fall from a horse.

Major Black was born on the 15th August, 1883, at Clontarf, Dublin. He was educated at Clifton College, and graduated at the Royal Veterinary College, Dublin, on the 23rd July, 1906.

He joined the Royal Army Veterinary Corps as a lieutenant on the 13th February, 1907, was promoted captain, 13th February, 1912, and major, 13th February, 1922.

He proceeded to France with the first Expeditionary Force, being in command of No. 4 Mobile Veterinary Section, and was invalided to England in February, 1915. On 17th February, 1915, he assumed command of the 10th Divisional Mobile Veterinary Section, and proceeded in command of that unit for duty with the Mediterranean Expeditionary Force in the summer of 1915, serving in Egypt, Serbia and Greece. He was appointed O.C. No. 17 Veterinary Hospital, Salonika, on 13th February, 1916, and was subsequently appointed A.D.V.S. 10th Division of the same force, being granted the temporary rank of Major from April, 1916, to February, 1917, whilst holding this appointment. In March, 1917, he was given the appointment of O.C. No. 4 Reserve Veterinary Hospital, at Bulford, with the temporary rank of Major, and from there he proceeded to Ireland and appointed to command No. 5 Reserve Veterinary Hospital at the Curragh, retaining the temporary rank.

He proceeded to India for a tour of duty in January, 1920.

For his services during the war he was twice mentioned in despatches and received the Brevet rank of Major; he was also awarded the 1914 Star, and General Service and Victory Medals.

Major Black was popular amongst his fellow officers and we greatly deplore this sad termination of so promising a career.

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Whole-time Salaries.

Sir,—With reference to the recent correspondence on the subject of whole-time salaries, Captain Kirk's suggestions for the appointment of a committee, presumably by the N.V.M.A., to advise prospective candidates for whole-time appointments abroad is, I consider, a practical one.

Such a committee, if selected from among our members who have actually served abroad, would be in a position to give sound advice to our younger members.

The value of appointments vary a great deal in proportion to the cost of living, and as to whether quarters, adequate travelling allowances, etc., are provided. What may appear a high salary, to those who are willing to accept such a salary as that published for the guidance of our members in seeking a whole-time appointment in the British Isles, is often quite inedaquate, in the case of the salaries offered, for many of our colonial appointments.

Captain Kirk, however, is not correct when he states that "the salary of the veterinary officer is always amongst the lowest of any official employed in the colonial service," and although I agree that this is presumably the case in the Malay States and India as well as our West Indian colonies, I do not think it helps our argument much to include our African colonial services. Veterinary officers are certainly not among the lowest in the following colonies;

Gold Coast, Nigeria, S.W. Africa Protectorate, Union of South Africa, Bechuanaland Protectorate, Swaziland, Southern and Northern Rhodesia, Nyasaland, Tanganyika, Kenya and Uganda.

I append a table to show the salaries of officials in Nyasaland :—

Appointment.	Rate of Salary per annum.	Years of Service to reach maximum.	Remarks.
*Medical Officers ...	£600 to £800 by £25	8 years	
*Veterinary Officers	£500 to £700 by £25	8 ,,	
Tobacco Inspector...	£500 to £600 by £25	4 ,,	
Agricul. Chemist ...	£500 to £750 by £25	10 ,,	No prospect of promotion within Protectorate.
Entomologist ...	£500 to £750 by £25	10 ,,	
Asst. Attorney Genl.	£500 to £600 by £25	4 ,,	
*Forest Officers ...	£400 to £600 ...	9 ,,	
Asst. Engnrs. PWD	£400 to £600 ...	9 ,,	
Asst. Treasurers ...	£450 to £550 ...	5 ,,	Apptmts. from clerical staff.
Surveyors	£400 to £500 ...	5 ,,	
Administrative Offrs	£300 to £700 ...	15 ,,	
Agriculturists ...	£350 to £500 ...	10 ,,	
Postmasters ...	£250 to £400 ...	10 ,,	
Stockman	£200 to £300 ...	10 ,,	
Asst. Engnrs.(Trspt.)	£250 to £400 ...	10 ,,	
*Clerks (2nd Class) ...	£250 to £400 ...	10 ,,	

* The salaries of these appointments are the same in Uganda, Kenya, and Tanganyika.

The only anomaly in the case of these East African Protectorates is that whereas veterinary officers received the same salaries as medical officers prior to the war they now take second place.—J. A. GRIFFITHS, M.R.C.V.S., London School of Tropical Medicine, Endsleigh Gardens, N.W., *27th March*, 1921.

Allied Decorations for Veterinarians.

The following awards to British veterinary officers appear amongst the decorations which have been awarded by Allied Powers to the British Forces for distinguished service during the war :—

ORDRE DU MERITE AGRICOLE (FRANCE).

CHEVALIER.—Capt. R. R. Dalling, R.A.V.C. (S.R.); Major J. S. Nimmo, D.S.O., R.A.V.C.

Army Veterinary Service.

LONDON GAZETTE, WAR OFFICE—REGULAR FORCES.

April 3rd.—Captain E. C. Doyle, D.S.O., retires, receiving a gratuity (April 4th), and is granted the rank of Major; Major A. Leaning, D.S.O., to be acting Lieut.-Col. while holding the appointment of A.D.V.S. (February 17th).

April 4th.—Major A. Leaning, D.S.O., relinquishes the acting rank of Lieut.-Col. on ceasing to hold the appointment of A.D.V.S. (April 1st).

REGULAR ARMY RESERVE OF OFFICERS.

Regimental List.

April 3rd.—The following Majors, late R.A.V.C., to be Majors:—W. Jowett, F.R.C.V.S. (September 16th, 1921, with seniority February 6th, 1917); E. C. Doyle, D.S.O. (April 4th, with seniority March 16th, 1919); Captain J. D. Whitehead, F.R.C.V.S., late R.A.V.C., to be Captain (September 24th, 1921, with seniority March 14th, 1919).

Diseases of Animals Acts. 1894 to 1914. Summary of Returns.

Period.	Rabies. Cases Confirmed. Dogs.	Rabies. Cases Confirmed. Other Animals.	Anthrax. Outbreaks confirmed.	Anthrax. Animals attacked.	Foot-and-Mouth Disease. Outbreaks confirmed.	Foot-and-Mouth Disease. Animals slaughtered as diseased or exposed to infection.	Glanders (including Farcy).* Outbreaks reported by the Local Authorities.	Glanders (including Farcy).* Animals attacked.	Parasitic Mange. Outbreaks reported by the Local Authorities.	Parasitic Mange. Animals attacked.	Sheep Scab. Outbreaks reported by the Local Authorities.	Swine Fever. Outbreaks confirmed.	Swine Fever. Swine slaughtered as diseased or exposed to infection
GT. BRITAIN.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Week ended 1st April, 1922 ...	...	...	15	15	13	1209	...	...	29	44	11	14	7
Corresponding Week in 1921	1	...	9	13	...	...	1	1	42	79	6	20	10
Corresponding Week in 1920	...	...	9	11	...	...	...	...	92	126	9	54	20
Corresponding Week in 1919	3	...	3	4	...	...	2	15	140	268	11	18	6
Total for 13 weeks, 1922 ...	...	...	162	177	1058	50321	...	...	528	802	369	303	108
Corresponding period in 1921	17	1	179	209	24	2326	3	6	1013	1628	318	274	75
Corresponding period in 1920	3	...	128	159	39	2001	9	16	1809	3230	252	568	202
Corresponding period in 1919	27	2	51	70	19	1033	3	16	2116	4255	192	275	95
IRELAND.													
Week ended 1st April, 1922 ...	...	...	...	...	...	...	...	...	Outbreaks 4		4	3	16
Corresponding Week in 1921 ...	...	...	...	...	...	...	...	...	1		2	...	...
Corresponding Week in 1920 ...	...	...	...	...	...	...	...	...	2		20	...	1
Corresponding Week in 1919 ...	...	...	...	...	...	...	...	...	3		7	...	...
Total for 13 weeks, 1922	...	...	...	...	...	...	...	...	48		80	65	400
Corresponding period in 1921 ...	...	...	...	...	2	41	...	...	31		111	17	124
Corresponding period in 1920 ...	...	...	...	...	...	...	1	3	50		125	2	5
Corresponding period in 1919 ...	...	...	...	...	...	...	1	1	44		114	14	47

NOTE.—The figures for the current year are approximate only. *Excluding outbreaks in Army horses.

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SAVE THE FOALS AND CALVES

JOINT-ILL IN FOALS.

Antistreptococcic Serum, Equine (P., D. & Co.), is reported to have yielded most gratifying results as a prophylactic of joint-ill (also known as navel-ill, umbilical infection, pyæmic arthritis), see *Veterinary Record*, Nov. 16, 1918, p. 164; Jan. 1, 1921, p. 3; Sept. 24, 1921, p. 771. Each in-foal mare should be given 15 c.c. of the serum hypodermically, about the tenth and third days before the expected date of foaling, and each foal should be given 7·5 c.c. of the serum within from 24 to 48 hours after birth, and a similar dose after a week's interval.

This serum is also of great value in the *treatment* of joint-ill, also of strangles, poll-evil, fistulous withers, and all forms of streptococcus infection.

Immunisation of the mare with vaccine is also recommended (see *Veterinary Record*, Mar. 6, 1920, p. 418). For this purpose, PARKE, DAVIS & Co.'s **Streptococcus-Staphylococcus Bacterin, Equine,** should be injected hypodermically a few months before the date of foaling.

WHITE SCOUR IN CALVES.

Anti-White-Scour Serum, Bovine (P., D. & Co.), is believed to be almost specific for the prevention or treatment of the very fatal infectious disease of newly-born calves (also foals, pigs and lambs) known as "white scour."

AS A PREVENTIVE, from 10 to 20 c.c. of the serum should be injected hypodermically as soon as possible after the birth of the animal in any district in which white scour is prevalent.

AS A CURATIVE, 20 to 30 c.c. of the serum should be injected hypodermically as early as possible, and repeated every six to twelve hours whilst necessary.

A distinguished veterinary authority, writing on the subject of "White Scour" in *The Veterinary Record* of April 29, 1916, states:—"I have robbed several outbreaks of their normally "high casualties by the early use of a serum as prepared by "Messrs. Parke, Davis & Co."

Further particulars will be sent on request.

PARKE, DAVIS & Co., 50 BEAK STREET, REGENT STREET, LONDON, W.1.